

Application No. 10/719,441
Reply dated January 18, 2005
Reply to Office Action of October 18, 2004

REMARKS

Applicant has amended the specification to include a cross-reference to each application from which the present application claims priority. This amendment clarifies the priority information provided in the Application Data Sheet and the Declaration. Consistent with this amendment, applicant submits herewith a petition for an unintentionally delayed claim, a surcharge under 37 C.F.R. 1.17(t) and a statement that the delay was unintentional.

As the Examiner has indicated, in response to the July 23, 2004 Restriction Requirement, applicant has elected to prosecute claims 109-116. Accordingly, claims 108 and 117-122 have been withdrawn from consideration and claims 109-116 are currently pending in the present application.

Applicants request reconsideration of the present application in view of the following remarks.

THE REJECTIONS

I. Double Patenting Rejections

The Examiner has rejected claims 109-116 under the judicially created doctrine of obviousness-type double patenting, as allegedly being unpatentable over claims 72-83 of United States Patent 6,417,422. The Examiner has also rejected claims 109-111 under the judicially created doctrine of obviousness-type double patenting, as allegedly being

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unpatentable over claims 9 and 41 of United States Patent 6,355,854.* And, the Examiner has provisionally rejected claims 109-111 under the judicially created doctrine of obviousness-type double patenting, as allegedly being unpatentable over claims 24 and 26 of co-pending United States application 09/815,914.

Applicant will file a Terminal Disclaimer in compliance with 37 C.F.R. §1.321(c) upon notice that the claims are otherwise in condition for allowance.

II. Rejections under 35 U.S.C. §102(b)

The Examiner has rejected claim 109 under 35 U.S.C. §102(b), as allegedly being anticipated by United States Patent 4,524,236 (“McCain”).

The Examiner asserts that “McCain discloses an oxydehydrogenation process to convert alkanes (e.g., ethane) to alkenes (e.g., ethylene) by contacting the alkanes, in the presence of oxidizing agent, with a catalyst comprising nickel.” Office Action, page 4. The Examiner further asserts that, “since the reaction has a conversion of greater than 60%, the product would have a concentration of alkenes greater than 5% relative to total moles of hydrocarbon.” Ibid. Applicant traverses.

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* Applicant understands that the Examiner intended to cite commonly-assigned United States Patent 6,355,854 and not United States Patent 6,355,845, which is assigned on its face to Dow Chemical Company.

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McCain does not disclose the method of claim 109. McCain generally discloses a method for the oxydehydrogenation of ethane to ethylene using a calcined oxide catalyst containing Mo, V, Nb, Sb, and X, where "X" may be nickel oxide. In particular, the McCain method uses a reaction mixture that contains ethane, molecular oxygen and water. Col. 5, lines 8-17. The mixture may also contain other gases, such as, nitrogen, helium, carbon dioxide, and methane, as reaction diluents or heat moderators. Col. 5, lines 19-21. In the McCain method, the gaseous components of the reaction mixture are uniformly admixed prior to being introduced into the reaction zone. Col. 5, lines 32-34. In fact, McCain expressly specifies that the feed composition should have less than 5% alkene, stating that the ethane-containing feed is a gas stream that

"can also contain minor amounts of hydrogen, carbon monoxide, and the C₃-C₄ alkanes and alkenes, less than five volume percent of each"

See Col.5, lines 1-4 (emphasis added). Thus, McCain does not disclose that the reaction zone contains alkene *during* oxydehydrogenation as required by the presently-pending claims. Even if the Examiner's assertion that "the product would have a concentration of alkenes greater than 5% relative to total moles of hydrocarbon" were true, that is not a disclosure that alkene is present *in the reaction zone* in a molar concentration of at least about 5% during oxydehydrogenation. This is evident, in particular, noting that McCain discloses effecting the reaction in a flow reactor. (See McCain, Col.4, lines 65-66; also Col.5, lines 44-47).

In contrast, claim 109 requires that the reaction zone comprises alkene *during* oxydehydrogenation. In particular, the claim recites a method for preparing an alkene from the corresponding alkane using a catalyst comprising nickel in which the reaction zone comprises alkene in a molar concentration of at least about 5%, relative to total moles of hydrocarbon, during oxydehydrogenation with an alkane conversion of at least about 5% and an alkene selectivity of at least about 50%. Thus, the McCain method is distinguishable from claim 109 at least because it does not disclose the presence of alkene in the reaction zone during oxydehydrogenation.

The distinction between the McCain method and the method of claim 109 is the improved performance characteristics, *i.e.*, selectivity and conversion, for the conversion of alkanes to alkenes *even* in the presence of substantial amounts of alkene in the reaction zone. The improved performance characteristics of the claim 109 method is surprising, particularly with respect to ethane conversion, because ethylene is typically more reactive than ethane. See, e.g., specification page 23, lines 4-21. Because McCain fails to disclose an oxydehydrogenation process in which the reaction zone comprises alkene in a molar concentration of at least about 5%, relative to total moles of hydrocarbon, during the oxydehydrogenation, it fails to anticipate claim 109. Accordingly, applicant requests that the Examiner withdraw the 35 U.S.C. § 102(b) rejection.

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CONCLUSION

In view of the foregoing remarks, applicant requests that the Examiner withdraw the claim rejections and allow all claims of this application. If the Examiner believes that an interview would facilitate the resolution of any outstanding issues, he is kindly requested to contact the undersigned.

Respectfully submitted,

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